DIFFERENT WAYS TO GET TO THE FUTURE WE WANT

Complementing the roadmap emerging from the Bending the Curve Initiative, other new modelling has evaluated the effectiveness of two contrasting conservation planning strategies, each combined with measures to meet global climate and food security targets. Both are able to bend the curve of biodiversity loss, but this is only possible when combined with strong climate mitigation.

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Before COVID-19 stopped the world in its tracks, 2020 was being hailed as a 'super-year for nature' with three major conferences set to determine the pathway for action on climate and biodiversity over the next decade. At the UN Climate Change Conference (COP26) in Glasgow, countries were to submit their new long-term emission reduction goals; the UN Convention on Biological Diversity was to meet in Kunming in China to agree a new framework and targets; and a Leader's Biodiversity Summit was planned for October in New York as part of the UN's 75th anniversary celebrations.

Most of these conferences have been pushed into 2021, but much of the work helping to underpin the decision-making has been done. This included new scenario projections with the IMAGE-GLOBIO framework that explored the ability of two contrasting conservation planning strategies to bend the curve of biodiversity loss, while incorporating measures to safeguard global food security and limit global warming to well below 2°C. By looking at these goals simultaneously, some of the potential trade-offs from climate mitigation could be addressed while exploring the full mitigation potential of land-based measures.

The IMAGE-GLOBIO modelling framework[16, 17] was used to explore the effectiveness of these two contrasting strategies under the assumptions of a business-as-usual trend for population growth and socio-economic development (SSP2). It also aimed to achieve climate change mitigation and food security goals in 2050[18].

Newly threshed rice ready to be brought to a milling area for husk removal, Camarines Sur, Bicol, Philippines.

The first of these high-profile conservation strategies – the 'half-Earth' scenario – calls for the expansion of the world's protected areas to cover half of the Earth [9-13]. This strategy is based on the belief that it is best to separate human pressures from nature to bend the curve of biodiversity loss. It relies on what's known as 'land-sparing': that is, promoting wilderness through restoration and the extension of protected and conservation areas.

In contrast, the second conservation strategy – the 'sharing the planet' scenario – aims to support biodiversity while providing goods and services for humanity [14, 15]. This strategy takes the view that it is best to live with and through nature, connecting biodiversity targets with the achievement of a good quality of life. It relies on 'land-sharing' or integrating biodiversity conservation within the agricultural landscape.

In the 'half Earth' scenario, 50% of each ecoregion in the world was protected for biodiversity conservation, while the other 50% was used to sustain human needs. To safeguard food security, this scenario also included the sustainable intensification of agricultural production by, for example, efficient nutrient use, pest management and genetic modification.

The 'sharing the planet' scenario focused on conserving areas that support and enhance the provisioning of various ecosystem services (such as carbon storage, pollination and pest control) by adding high-carbon forests, riparian zones, water towers, peatlands and urban green spaces to current protected areas and key biodiversity areas, covering up to 30% of the global terrestrial area. This scenario relied on agricultural production from advanced agroecology, organic farming, agroforestry and diversified farming systems.

It was found that both conservation strategies have the potential to reverse the trend of biodiversity loss, but only in combination with a broader set of sustainability measures aimed at mitigating climate change and safeguarding food security. These include production measures in agricultural and energy systems (e.g. increasing agricultural productivity) as well as consumption-based measures (such as reducing food waste and animal product consumption). With this full package of measures, losses in local compositional biodiversity intactness (as measured by the mean species abundance indicator) were reversed in 2030 and numbers increased to similar or higher values in 2050 compared to 2015, while the number of people at risk of hunger decreased and the global temperature increase was kept well below 2°C.

Modelling like this can help us to understand the effectiveness and potential trade-offs of different actions and to make choices on the pathway forwards. The 'half Earth' strategy slightly outperformed the 'sharing the planet' strategy in terms of biodiversity restoration, while 'sharing the planet' was more beneficial in terms of ecosystem service provisioning, food prices and food security. These results suggest a need to combine both conservation strategies, such that areas strictly protected for biodiversity conservation are surrounded by human-used land that is managed favourably for biodiversity and ecosystem services provisioning [15].

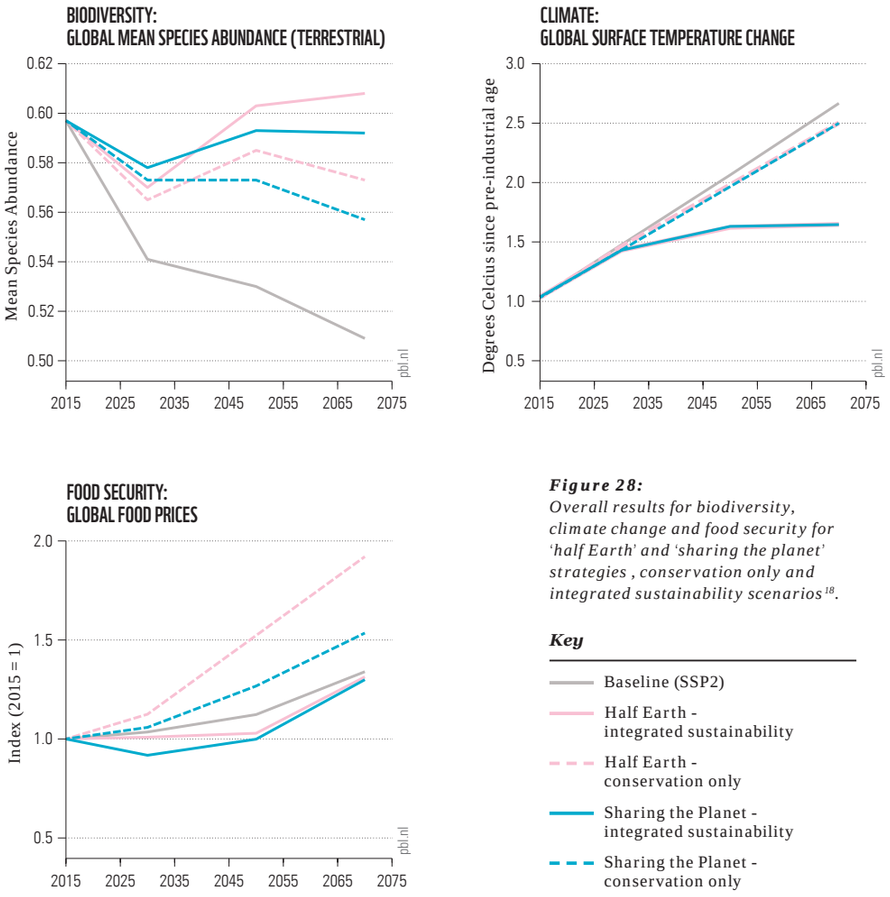

Figure 28:
Overall results for biodiversity, climate change and food security for 'half Earth' and 'sharing the planet' strategies , conservation only and integrated sustainability scenarios [18].